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Study of the 222 nm KrCl emission produced by nanosecond pulsed arrays of microdischarges VIRGINIE MARTIN, GERARD BAUVILLE, BERNARD LACOUR, VINCENT PUECH, LPGP, CNRS-UPS, Orsay, France —
Microdischarges operating in DC mode have been widely used for producing VUV emission from rare-gas excimers. However for biological applications, pulsed UV sources emitting in the range 200-280 nm (DNA absorption band) are required. They can be obtained from exciplex molecules produced in discharges operating in rare-gas halogen mixtures. Up to now, DBD's have been mainly used to generate these emissions. However, the use of arrays of microdischarges could be very advantageous due to a simpler geometry, a reduced operating voltage and the possibility of higher power loading. The present paper reports results obtained from arrays of microdischarges powered, in Kr/Cl2 mixtures, by nanosecond pulsed discharges operating at high repetition frequency. It will be shown that, without individual resistive ballasting, the nanosecond pulsed mode allows the simultaneously ignition of all microdischarges. As a result, an intense emission at 222 nm is obtained. Weak emissions from Cl2* at 258 nm and from krypton at 762 nm are also detected. The influence, on the intensity of these emissions, of the different experimental parameters: total pressure, chlorine concentration, energy per pulse and repetition rate frequency, was studied and the conditions allowing the optimization of the 222 nm will be reported.

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